Owner's Manual

SmartPro® Rackmount

Intelligent, Line-Interactive UPS Systems

• SMX500RT1U • SMX750RT1U • SMX1000RT2U
• SMX1500XLRT2U • SMX3000XLRT2U

• 230V Sine-Wave Input/Output • 500VA - 3000VA Capacities
• Extended-Run Options*

** SMX1500XLRT2U and SMX3000XLRT2U models*

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TRIPP·LITE
POWER PROTECTION

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Customer Support: (773) 869-1234 • www.tripplite.com

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Important Safety Instructions

SAVE THESE INSTRUCTIONS

This manual contains important instructions that should be followed during the installation, operation and storage of all Tripp Lite UPS Systems. Failure to heed these warnings will void your warranty.

UPS Location Warnings

- Use caution when lifting your UPS. Because of the considerable weight of all rackmount UPS systems, at least two people should assist in lifting and installing them.
- Install your UPS indoors, away from excess moisture or heat, dust or direct sunlight.
- For best performance, the ambient temperature near your UPS should be between 0° C and 40° C (between 32° F and 104° F).
- Leave adequate space around all sides of the UPS for proper ventilation. Do not obstruct its vents or fan openings.

UPS Connection Warnings

- The UPS contains its own energy source (battery). The output terminals may be live even when the UPS is not connected to an AC supply.
- Connect your UPS to a properly grounded AC power outlet. Do not modify the UPS's plug in a way that would eliminate the UPS's connection to ground. Do not use adapters that eliminate the UPS's connection to ground.
- Do not plug your UPS into itself; this will damage the UPS and void your warranty.
- If you are connecting your UPS to a motor-powered AC generator, the generator must provide filtered, frequency-regulated computer-grade output.

Equipment Connection Warnings

- Do not use Tripp Lite UPS Systems for life support applications in which a malfunction or failure of a Tripp Lite UPS System could cause failure or significantly alter the performance of a life-support device.
- Do not connect surge suppressors or extension cords to the output of your UPS. This might overload the UPS and will void the surge suppressor and UPS warranties.

Battery Warnings

- Batteries can present a risk of electrical shock and burn from high short-circuit current. Observe proper precautions. Do not dispose of the batteries in a fire. Do not open the UPS or batteries. Do not short or bridge the battery terminals with any object. Unplug and turn off the UPS before performing battery replacement. Use tools with insulated handles. There are no user-serviceable parts inside the UPS. Battery replacement should be performed only by authorized service personnel using the same number and type of batteries (sealed Lead-Acid). The batteries are recyclable. Refer to your local codes for disposal requirements or in the USA only call 1-800-SAV-LEAD or 1-800-8-BATTERY (1-800-8-228-8379) or visit www.rbrc.com for recycling information. Tripp Lite offers a complete line of UPS System Replacement Battery Cartridges (R.B.C.). Visit Tripp Lite on the Web at www.tripplite.com to locate the specific replacement battery for your UPS.
- During hot-swap battery replacement, the UPS will not provide backup power in the event of a blackout or other power interruptions.
- Do not operate UPS without batteries.
- When adding external battery packs to select models with external battery pack connectors, connect only Tripp Lite-recommended battery packs of the correct voltage and type. Do not connect or disconnect battery packs when the UPS is operating on battery power.

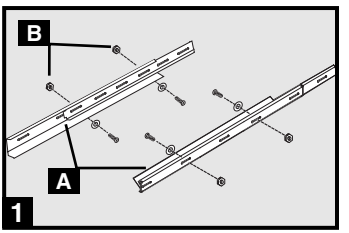
Mounting (Rack)

Mount your equipment in either a 4-post or 2-post rack or rack enclosure (see next page for 2-post mounting). The user must determine the fitness of hardware and procedures before mounting. If hardware and procedures are not suitable for your application, contact the manufacturer of your rack or rack enclosure. The procedures described in this manual are for common rack and rack enclosure types and may not be appropriate for all applications.

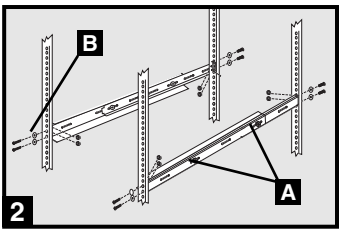
4-Post Mounting

All UPS models include hardware required to mount in a 4-post rack. Select models include an adjustable rackmount shelf kit to provide additional support. **If your UPS model does not include an adjustable rackmount shelf kit, skip steps 1 and 2.**

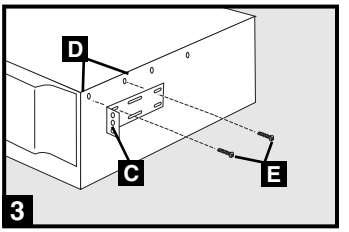
1 Connect the two segments of each shelf **A** using the included screws and nuts **B**. Leave the screws slightly loose so that the shelves can be adjusted in the next step.



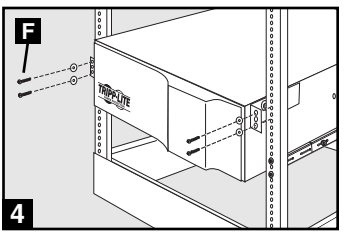
2 Adjust each shelf to fit your rack, then mount them in the lowest available space of your rack with the screws, nuts and washers provided **B**. Note that the support ledges should face inward. Tighten the screws that connect the shelf segments **A**.



3 Attach mounting ears **C** to the front mounting holes of your UPS **D** using the screws provided **E**. The ears should face forward.



4 Using an assistant if necessary, lift your UPS and slide it onto the mounting shelves (if your model includes the shelves). Attach your UPS to the rack by using the appropriate hardware **F** through its mounting ears and into the rack rails.



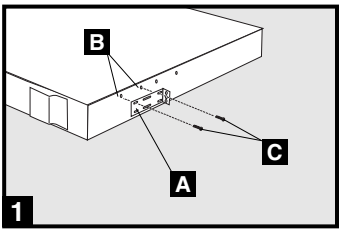
Mounting (Rack) *continued*

2-Post (Telecom) Mounting

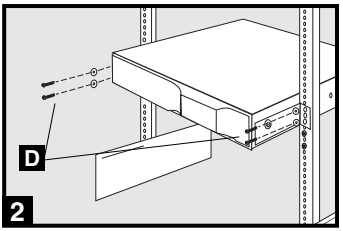
Mount 1U UPS models in 2-post racks with user-supplied hardware following the procedure below.

If you mount 2U UPS models in 2-post racks, they require the addition of a Tripp Lite 2-Post Rackmount Installation Kit (model: 2POSTRMKIT, sold separately). See Installation Kit owner's manual for installation procedure for 2U UPS models.

1 Attach mounting ears **A** to the front mounting holes of your UPS **B** using the screws provided **C**. The ears should face backward.



2 Using an assistant if necessary, lift your UPS and attach it to the rack by passing the screws, nuts and washers provided **D** through its mounting ears and into the rack rails.

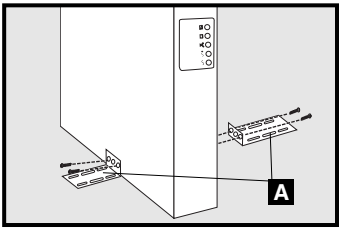


Mounting (Tower)

Mount all UPS models in an upright, tower position using included hardware. The user must determine the fitness of hardware and procedures before mounting.

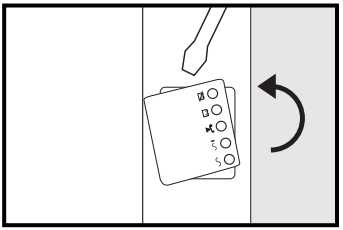
All UPS Models

Stand your UPS on its side with the LED/Control panel at the top. Attach one rack mounting ear **A** to each side of the UPS using included screws.



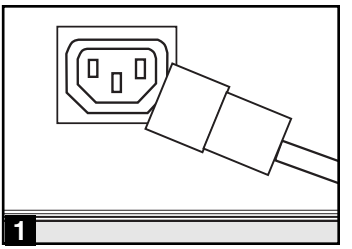
2U UPS Models Only

Rotate the LED/Control panel to view it easier while the UPS is tower mounted. Insert a small screwdriver, or other tool, in the slots on either side of the panel. Pop the panel out; rotate it; and pop the panel back in place.



Quick Installation

1 Unplug computer's power cord from both AC outlet and computer's AC input.

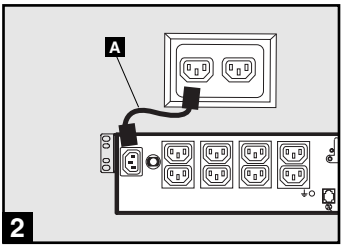


IEC320-C14 plug shown

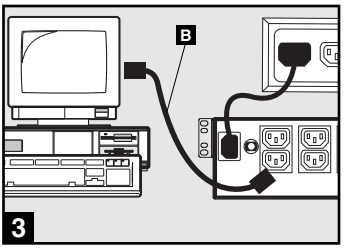
2 A Insert the female plug of computer's cord into UPS's AC input. Insert the male plug of computer's cord into AC outlet.*

NOTE! after you plug the UPS into a live AC outlet, the UPS (in "Standby" mode) will automatically charge its batteries,** but will not supply power to its outlets until it is turned ON (see Step 3 below).

** See Specifications for circuit amperage requirements. ** The BATTERY CHARGE LED will be the only LED illuminated.*



3 Find one of the power cords that came with the UPS. B Insert the cord's female plug into computer's AC input. Insert the cord's male plug into any of UPS's female output receptacles.

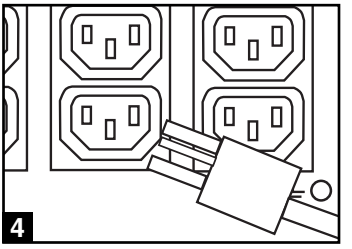


4 Plug your equipment into the UPS.*

Plug your equipment into the UPS. Repeat step 3 above using the additional power cord(s) that came with the UPS.

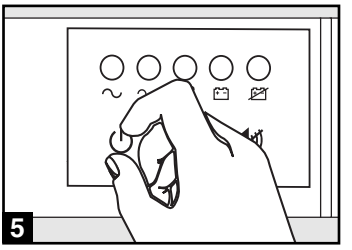
Note: Additional interconnection cords (C13 to C14) are available from Tripp Lite. Call 773-869-1234 (Part # P004-006).

** Your UPS is designed to support only computer equipment. You will overload the UPS if the total VA ratings for all the equipment you connect exceeds the UPS's Output Capacity (see Specifications). To find your equipment's VA ratings, look on their nameplates. If the equipment is listed in amps, multiply the number of amps by 240 to determine VA. (Example: 1 amp × 240 = 240 VA). If you are unsure if you have overloaded the UPS's outlets, see "OUTPUT LOAD LEVEL" LED description.*



5 Turn the UPS ON.

Press and hold the "ON/OFF/STANDBY" button for one second. The alarm will beep once briefly after one second has passed. Release the button.

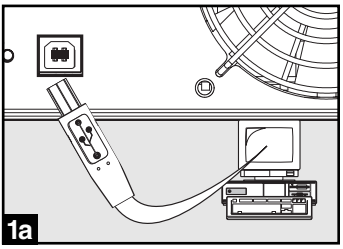


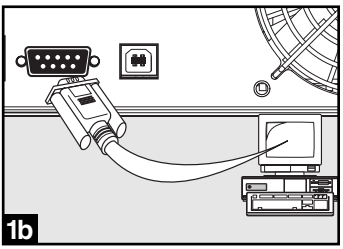
Optional Installation

These connections are optional. Your UPS will function properly without these connections. Note: SMX3000XLRT2U shown in all diagrams.

1 USB and RS-232 Serial Communications (all models)

Use the included USB cable (see 1a) and/or DB9 serial cable (see 1b) to connect the communication port on your computer to the communication port of your UPS. Install on your computer the Tripp Lite PowerAlert Software appropriate to your computer's operating system. Your UPS may feature additional communications ports; these ports may also be connected to additional computers which have PowerAlert Software installed. Consult your PowerAlert manual for more information.

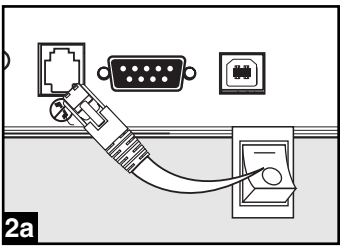


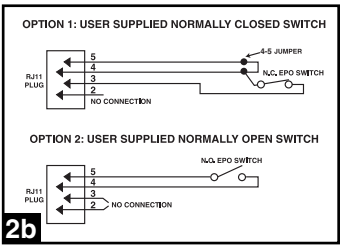


2 EPO Port Connection (all models)

This optional feature is only for those applications which require connection to a facility's Emergency Power Off (EPO) circuit. When the UPS is connected to this circuit, it enables emergency shutdown of the UPS's inverter.

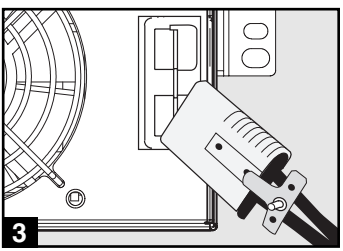
Using the cable provided, connect the EPO port of your UPS (see 2a) to a user-supplied normally closed or normally open switch according to the circuit diagram (see 2b). The EPO port is not a phone line surge suppressor; do not connect a phone line to this port.





3 External Battery Connection (select models)

All UPS models come with a robust internal battery system; select models feature connectors that accept optional external battery packs (sold separately from Tripp Lite) to provide additional runtime. Adding external batteries will increase recharge time as well as runtime. See battery pack owner's manual for complete installation instructions. Make sure cables are fully inserted into their connectors. Small sparks may result during battery connection; this is normal. Do not connect or disconnect battery packs when the UPS is running on battery power.



Basic Operation

Buttons (Front Panel)

"ON/OFF/STANDBY" Button

- **To turn the UPS ON:** with the UPS plugged into a live AC wall outlet*, press and hold the "ON/OFF/STANDBY" button for one second.** Release the button. If utility power is absent, you can "cold-start" the UPS (i.e.: turn it ON and supply power for a limited time from its batteries***) by pressing and holding the "ON/OFF/STANDBY" button for one second.**
- **To turn the UPS OFF:** with the UPS ON and receiving utility power, press and hold the "ON/OFF/STANDBY" button for one second.** Then unplug the UPS from the wall outlet. The UPS will be completely OFF.

** After you plug the UPS into a live AC outlet, the UPS (in "Standby" mode) will automatically charge its batteries, but will not supply power to its outlets until it is turned ON. ** The alarm will beep once briefly after the indicated interval has passed. *** If fully charged.*

"MUTE/TEST" Button

To Silence (or "Mute") UPS Alarms: briefly press and release the MUTE/TEST button.

To Run a Self-Test: with your UPS plugged in and turned ON, press and hold the MUTE/TEST button for two seconds.* Continue holding the button until the alarm beeps several times and the UPS performs a self test. See "Results of a Self-Test" below. Note: you can leave connected equipment on during a self-test. Your UPS, however, will not perform a self-test if the UPS is not turned on (see "ON/OFF/STANDBY" Button description).

CAUTION! Do not unplug your UPS to test its batteries. This will remove safe electrical grounding and may introduce a damaging surge into your network connections.

Results of a Self-Test: the test will last approximately 10 seconds as the UPS switches to battery to test its load capacity and battery charge.

- If the "OUTPUT LOAD LEVEL" LED remains lit red and the alarm continues to sound after the test, the UPS's outlets are overloaded. To clear the overload, unplug some of your equipment and run the self-test repeatedly until the "OUTPUT LOAD LEVEL" LED is no longer lit red and the alarm is no longer sounding.

CAUTION! Any overload that is not corrected by the user immediately following a self-test may cause the UPS to shut down and cease supplying output power in the event of a blackout or brownout.

- If the "BATTERY WARNING" LED remains lit and the alarm continues to sound after the test, the UPS batteries need to be recharged or replaced. Allow the UPS to recharge continuously for 12 hours, and repeat the self-test. If the LED remains lit, contact Tripp Lite for service. If your UPS requires battery replacement, visit www.tripplite.com to locate the specific Tripp Lite replacement battery for your UPS.

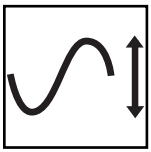
** The alarm will beep once briefly after the indicated interval has passed.*

Basic Operation *continued*

Indicator Lights (Front Panel)

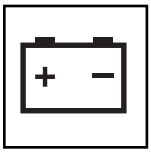
All Indicator Light descriptions apply when the UPS is plugged into a wall outlet and turned ON.

"POWER" LED: this green LED lights continuously when the UPS is ON and supplying connected equipment with AC power from a utility source. The LED flashes and an alarm sounds (4 short beeps followed by a pause) to indicate the UPS is operating from its internal batteries during a blackout or severe brownout. If the blackout or severe brownout is prolonged, you should save files and shut down your equipment since internal battery power will eventually be depleted. See "BATTERY CHARGE" LED description below.

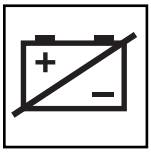


"VOLTAGE CORRECTION" LED: this green LED lights continuously whenever the UPS is automatically correcting high or low AC voltage on the utility line without the assistance of battery power. The UPS will also emit a slight clicking noise. These are normal, automatic operations of the UPS, no action is required on your part.

"OUTPUT LOAD LEVEL" LED: this multicolored LED indicates the approximate electrical load of equipment connected to the UPS's AC outlets. It will turn from green (light load) to yellow (medium load) to red (overload). If the LED is red (either illuminated continuously or flashing), clear the overload immediately by unplugging some of your equipment from the outlets until the LED changes from red to yellow (or green). CAUTION! Any overload that is not corrected by the user immediately may cause the UPS to shut down and cease supplying output power in the event of a blackout or brownout.

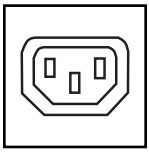


"BATTERY CHARGE" LED: when the UPS is operating from utility power, this LED indicates the approximate charge state of the UPS's internal batteries: red indicates the batteries are beginning to charge; yellow indicates the batteries are roughly midway through charging; and green indicates the batteries are fully charged. When the UPS is operating from battery power during a blackout or severe brownout, this LED indicates the approximate amount of energy (ultimately affecting runtime) which the UPS's batteries will provide: red indicates a low level of energy; yellow indicates a medium level of energy; and green indicates a high level of energy. Since the runtime performance of all UPS batteries will gradually deplete over time, it is recommended that you periodically perform a self-test (see MUTE/TEST Button description) to determine the energy level of your UPS batteries BEFORE a blackout or severe brownout occurs. During a prolonged blackout or severe brownout, you should save files and shut down your equipment since battery power will eventually be depleted. When the LED turns red and an alarm sounds continuously, it indicates the UPS's batteries are nearly out of power and UPS shut down is imminent.

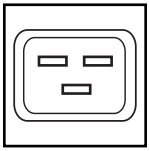


"BATTERY WARNING" LED: this LED lights red and an alarm sounds intermittently after you complete a self test (See "MUTE/TEST" Button description) to indicate the UPS batteries need to be recharged or replaced. Allow the UPS to recharge continuously for 12 hours, and repeat the self-test. If the LED continues to light, contact Tripp Lite for service. If your UPS requires battery replacement, visit www.tripplite.com to locate the specific Tripp Lite replacement battery for your UPS.

Other UPS Features (Rear Panel)

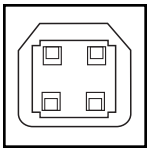


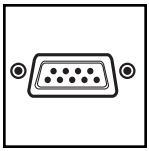
IEC320-C13/230V



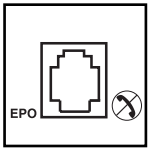
IEC320-C19/230V

AC Receptacles: Your UPS features IEC320-C13 outlets, and select models also feature IEC320-C19 outlets. These output receptacles provide your connected equipment with AC line power during normal operation and battery power during blackouts and brownouts. The UPS protects equipment connected to these receptacles against damaging surges and line noise. If you have a serial or USB connection to your UPS, you can remotely reboot connected equipment by turning the receptacles OFF and ON using Tripp Lite's PowerAlert Software. Select models have their receptacles divided into one or more load banks (labelled "LOAD 1," etc.) which may be remotely switched OFF and ON using Tripp Lite UPS software without interrupting power to equipment connected to the other outlets. Select models also feature outlets labelled "UNSWITCHED", which may not be remotely switched off. Unswitched outlets can only be turned off by turning off all of the output receptacles. See software instructions for details.

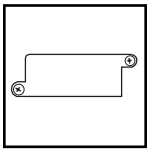




Communications Ports (USB or RS-232): These ports connect your UPS to any workstation or server. Use with Tripp Lite's PowerAlert Software and included cables to enable your computer to automatically save open files and shut down equipment during a blackout. Also use PowerAlert Software to monitor a wide variety of AC line power and UPS operating conditions. Consult your PowerAlert Software manual or contact Tripp Lite Customer Support for more information. See "USB and RS-232 Serial Communications" in the "Optional Installation" section for installation instructions.

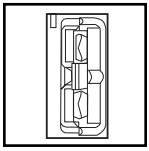


EPO (Emergency Power Off) Port: Your UPS features a EPO port that may be used to connect the UPS to a contact closure switch to enable emergency inverter shutdown. See Optional Connection.



Accessory Slot: Remove the small cover panel from this slot to install optional accessories to remotely monitor and control your UPS. Refer to your accessory's manual for installation instructions. Contact Tripp Lite Customer Support at (773) 869-1234 for more information, including a list of available SNMP, network management and connectivity products.

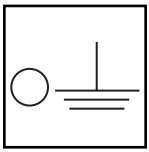
Power Sensitivity Adjustment (Select Models): This dial is normally set fully counter-clockwise, which enables the UPS to provide maximum protection against waveform distortions in its AC input. When such distortion occurs, the UPS will normally switch to providing sine wave power from its battery reserves for as long as the distortion is present. In areas with poor utility power or where the UPS's input power comes from a backup generator, chronic waveform distortion could cause the UPS to switch to battery too frequently, draining its battery reserves. You may be able to reduce how often your UPS switches to battery due to moderate waveform distortion by experimenting with different settings for this dial. As the dial is turned clockwise, the UPS becomes more tolerant of variations in its input power's AC waveform. NOTE: The further the dial is adjusted clockwise, the greater the degree of waveform distortion the UPS will allow to pass to connected equipment. When experimenting with different settings for this dial, operate connected equipment in a safe test mode so that the effect on the equipment of any waveform distortions in the UPS's output can be evaluated without disrupting critical operations.



External Battery Connector (Select Models Only): Use to connect Tripp Lite external battery packs for additional runtime. The specifications section of this manual lists the Tripp Lite external battery packs that are compatible with your model. Refer to instructions available with the battery pack for complete connection information and safety warnings.

Input Breaker(s) (all models): Protect your electrical circuit from overcurrent draw from the UPS load. If these breakers trip, remove some of the load; then reset them by pressing the breaker(s) in.

Output Breaker(s) (select models): Protect your UPS from output overload. If one or more breakers trip, remove some of the load on the circuit(s), then reset them by pressing the breaker switch(es) in.



Ground Screw: Use this to connect any equipment that requires a chassis ground.

Storage and Service

Storage

Before storing your UPS, turn it completely OFF: with the UPS ON and receiving utility power, press and hold the "ON/OFF/STANDBY" button for one second (an alarm will beep once briefly after the interval has passed); then, unplug the UPS from the wall outlet. If you store your UPS for an extended period of time, recharge the UPS batteries once every three months: plug the UPS into a wall outlet; allow it to charge for 12 hours; and then unplug it and place it back in storage. Note: after you plug the UPS in, it will automatically begin charging its batteries; however, it will not supply power to its outlets (see Quick Installation section). If you leave your UPS batteries discharged for an extended period of time, they will suffer a permanent loss of capacity.

Service

Before returning your UPS for service, follow these steps:

1. Review the installation and operation instructions in this manual to ensure that the service problem does not originate from a misreading of the instructions. Also, check that the UPS System's circuit breaker(s) are not tripped. This is the most common cause of service inquiries which can be easily remedied by following the resetting instructions in this manual.

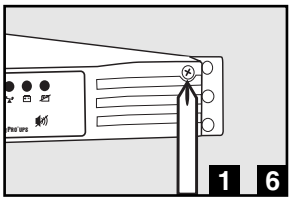
2. If the problem continues, do not contact or return the UPS to the dealer. Instead, call Tripp Lite at (773) 869-1233. A service technician will ask for the UPS's model number, serial number and purchase date and will attempt to correct the problem over the phone.

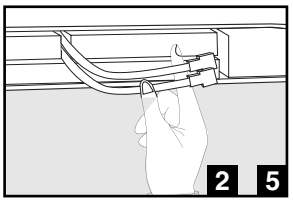
3. If the problem requires service, the technician will issue you a Returned Material Authorization (RMA) number, which is required for service. If you require packaging, the technician can arrange to send you proper packaging. Securely pack the UPS to avoid damage during shipping. Do not use Styrofoam beads for packaging. Any damages (direct, indirect, special, incidental or consequential) to the UPS incurred during shipment to Tripp Lite or an authorized Tripp Lite service center is not covered under warranty. UPS Systems shipped to Tripp Lite or an authorized Tripp Lite service center must have transportation charges prepaid. Mark the RMA number on the outside of the package. If the UPS System is within the 2-year warranty period, enclose a copy of your sales receipt. Return the UPS for service using an insured carrier to the address given to you by the Tripp Lite service technician.

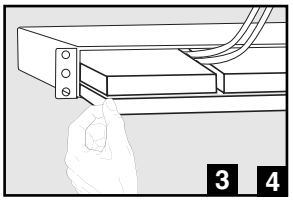
Battery Replacement

Under normal conditions, the original batteries in your UPS will last many years. See Safety section before replacing batteries. The batteries are designed for hot-swap replacement (i.e. leaving the UPS in ON mode), but qualified service personnel may wish to put the UPS in the OFF mode before proceeding.

1U UPS Models



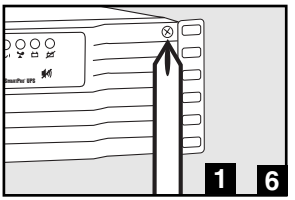


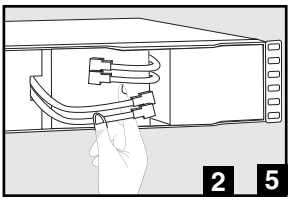


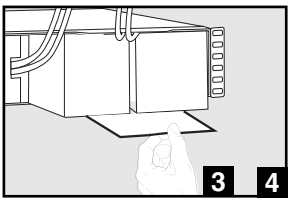
Procedure

1. **Remove Front Panel**
2. **Disconnect Batteries**
3. **Remove/Dispose of Batteries**
4. **Add Batteries**
5. **Connect Batteries**
   Attach connectors: black-to-black and red-to-red.
6. **Replace Front Panel**

2U UPS Models







Specifications

Model Series #	SMX500RT1U AGSMX500RT1U	SMX750RT1U AGSM751SRM1U	SMX1000RT2U AGSM4724	SMX1500XLRT2U AGSM152DRTI2U	SMX3000XLRT2U AGSM4878
Input					
Nominal Voltage/Frequency:	230VAC, 50/60Hz	230VAC, 50/60Hz	230VAC, 50/60Hz	230VAC, 50/60Hz	230VAC, 50/60Hz
Suggested Circuit:	10 amp	10 amp	10 amp	10 amp	20 amp
Output					
Capacity (VA/Watts)	500/300	750/450	1000/700	1500/1000	3000/2250
On Line Nominal Voltage/Waveform:	230VAC/sine wave	230VAC/sine wave	230VAC/sine wave	230VAC/sine wave	230VAC/sine wave
On Battery Nominal Voltage/Waveform:	230VAC/PWM sine wave	230VAC/sine wave	230VAC/sine wave	230VAC/sine wave	230VAC/sine wave
Battery Recharge Time (to 90% charge)	2-4 hrs.	2-4 hrs.	2-4 hrs.	2-4 hrs.	2-4 hrs.
Typical Transfer Time	2-4 ms.	2-4 ms.	2-4 ms.	2-4 ms.	2-4 ms.
Approvals:	CE, GOST, SASO, IRAM	CE, GOST, SASO, IRAM	CE, GOST, SASO, IRAM	CE, GOST, SASO, IRAM	CE, GOST, SASO, IRAM

ALL MODELS: Voltage-Regulated Output Voltage Range (230V +/- 9%); On Battery Output Voltage Range (230V +/- 5%); AC Surge Suppression (exceeds IEEE 587 Cat. A & B standards); AC Noise Attenuation (>40 dB); AC Protection Modes (H to N).

The policy of Tripp Lite is one of continuous improvement. Specifications are subject to change without notice.

Note on Labeling

Two symbols are used on the label.

V~ : AC Voltage
V⎓ : DC Voltage

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